PATENT ABSTRACTS OF JAPAN

(54) INTERACTIVE SYSTEM, INTERACTIVE METHOD AND BI-DIRECTIONAL
INTERACTIVE SYSTEM, BI-DIRECTIONAL INTERACTIVE METHOD AND
RECORDING MEDIUM

(57)Abstract:
PROBLEM TO BE SOLVED: To provide an interactive system for preventing a user
such as a driver from getting tired or dozing by realizing interactive processing for
preventing the user from getting tired by changing words or the like to be uttered by
this system.
SOLUTION: This system is provided with a microphone 1 for inputting a voice uttered
by a user, a voice recognition processing part 3 for recognizing the voice inputted by
the microphone 1, and for converting the recognized voice into an input symbol string,
a conversation pattern processing part 5 for inputting the input symbol string from
the voice recognition processing part 3, and for outputting an output symbol string
corresponding to the input symbol string based on a preliminarily described
conversion pattern, a voice synthesis processing part 7 for converting the output
symbol string from the conversation pattern processing part 5 into a voice, a speaker
9 for outputting and uttering the voice from the voice synthesis processing part 7,
and a conversion learning part 41 for capturing the characteristics of the

conversation of the user based on the input symbol string from the conversation pattern processing part 5, and for changing the output symbol string according to the captured characteristics of the conversation.

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CLAIMS

[Claim(s)]
[Claim 1] The voice input section which inputs the voice which a user utters, and the speech recognition processing section which changes into an input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was beforehand described from this speech recognition processing section, The speech synthesis processing section which changes said output symbol string from this conversation pattern processing section into voice, The property of said user's conversation is grasped based on said input-symbol train from the voice output section which outputs the voice from this speech synthesis processing section, and speaks, and said conversation pattern processing section. The dialog system characterized by having the conversation property control section to which said output symbol string is changed according to the property of the grasped conversation.

[Claim 2] Said conversation property control section is a dialog system according to claim 1 characterized by optimizing the subject of the conversation at the time of utterance, a conversation pattern, a generating word, response spacing of conversation, the frequency of utterance, and timing based on utterance time amount or number of utterance words of a word and a conversation pattern with a user's high use frequency, specific subject, the count of a response of conversation, and a user.

[Claim 3] The voice input section which inputs the voice which a user utters, and the speech recognition processing section which changes into an input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was beforehand described from this speech recognition processing section, The speech synthesis processing section which changes said output symbol string from this conversation pattern processing section into voice, The voice output section which outputs the voice from this speech synthesis processing section, and speaks, and the storage section which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered, The dialog system which extracts the class word/related term relevant to [resemblance and] the word which said user uttered from said storage section, and is characterized by having the associative function part which outputs said extracted class word/related term to said conversation pattern processing section based on said input-symbol train from said conversation pattern processing section.

[Claim 4] The voice input section which inputs the voice which a user utters, and the 1st speech recognition processing section which changes into the 1st input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said 1st input-symbol train based on the conversation pattern which inputted said 1st input-symbol train and was beforehand described from this 1st speech recognition processing section, The speech synthesis processing section which changes said output symbol string from this conversation pattern processing section into voice, The voice output section which outputs the voice from this speech synthesis processing section, and speaks, and the 2nd speech recognition processing section which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, The dialog system characterized by having the event data storage section which memorizes said 2nd input-symbol train as event data.

[Claim 5] The dialog system according to claim 4 characterized by having the event data-processing section which only the symbol string which a user demands among said 2nd input-symbol trains changed in said 2nd speech recognition processing section is extracted [section], and makes said event data storage section memorize the extracted symbol string.

[Claim 6] The dialog system according to claim 4 or 5 characterized by having the conversation property control section to which said output symbol string is changed according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train from said conversation pattern processing section.

[Claim 7] The storage section which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered, The associative function part which extracts the class word/related term relevant to [resemblance and] the word which said user uttered from said storage section, and outputs said extracted class word/related term to said conversation pattern processing section based on said input-symbol train from said conversation pattern processing section, The dialog system of claim 4 characterized by preparation ****** thru/or claim 6 given in any 1 term.

[Claim 8] It is the bidirectional dialog system which is equipped with two or more dialog systems which perform interactive processing among users, and communicates between each set talk systems. Said each set talk system The voice input section which inputs the voice which a user utters, and the speech recognition processing section which changes into an input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was beforehand described from this speech recognition processing section, The speech synthesis processing section which changes said output symbol string from this conversation pattern processing section into voice, It transmits to other dialog systems by using said input-symbol train as event data with the voice output section which outputs the voice from this speech synthesis processing section, and speaks. said -- others -- the event data transfer section which receives the event data which consist of a symbol string from a dialog system, and this event data transfer section -- said -- others -- the bidirectional dialog system characterized by having the event data storage section which memorizes the event data received from the dialog system.

[Claim 9] When said privacy protection directions are not inputted from the input section which inputs privacy protection directions of said user, and this input section, Said event data gained by said user's utterance are sent out to a dialog system besides the above. The bidirectional dialog system according to claim 8 characterized by sending out said event data gained by said user's utterance to a dialog system besides the above, twisting them, and having a privacy protection function part when said privacy protection directions are inputted from said input section.

[Claim 10] The bidirectional dialog system according to claim 8 or 9 characterized by having the conversation property control section to which said output symbol string is changed according to the property of the conversation which has grasped and

grasped the property of said user's conversation based on said input-symbol train from said conversation pattern processing section.

[Claim 11] The storage section which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered, The associative function part which extracts the class word/related term relevant to [resemblance and] the word which said user uttered from said storage section, and outputs said extracted class word/related term to said conversation pattern processing section based on said input-symbol train from said conversation pattern processing section, The bidirectional dialog system of claim 8 characterized by preparation ****** thru/or claim 10 given in any 1 term.

[Claim 12] The bidirectional dialog system of claim 8 characterized by having the 2nd speech recognition processing section which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, and the event data storage section which memorizes said 2nd input-symbol train as event data thru/or claim 11 given in any 1 term.

[Claim 13] Speech recognition down stream processing which changes into an input-symbol train the voice recognized by recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, The dialogue approach characterized by having the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train.

[Claim 14] Said conversation property control process is the dialogue approach according to claim 13 characterized by optimizing the subject of the conversation at the time of utterance, a conversation pattern, a generating word, response spacing of conversation, the frequency of utterance, and timing based on utterance time amount or number of utterance words of a word and a conversation pattern with a user's high use frequency, specific subject, the count of a response of conversation, and a user.

[Claim 15] Speech recognition down stream processing which changes into an input-symbol train the voice recognized by recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said input-symbol train by the conversation pattern processing section based on the conversation pattern which inputted said input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, The storage process which memorizes the class word/related term relevant to

[resemblance and] the word which said user uttered in the storage section, The dialogue approach which extracts the class word/related term relevant to [resemblance and] the word which said user uttered from said storage section, and is characterized by having the associative functional process which outputs said extracted class word/related term to said conversation pattern processing section based on said input-symbol train.

[Claim 16] The 1st speech recognition down stream processing which changes into the 1st input-symbol train the voice recognized by recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said 1st input-symbol train based on the conversation pattern which inputted said 1st input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, The dialogue approach characterized by having the 2nd speech recognition down stream processing which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, and the storage process which memorizes said 2nd input-symbol train as event data.

[Claim 17] The dialogue approach according to claim 16 characterized by having the event data-processing process of extracting only the symbol string which a user demands among said 2nd input-symbol trains changed by said 2nd speech recognition down stream processing, and making said event data storage section memorizing the extracted symbol string.

[Claim 18] The dialogue approach according to claim 16 or 17 characterized by having the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train.

[Claim 19] The storage process which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered in the storage section, The associative functional process which extracts the class word/related term relevant to [resemblance and] the word which said user uttered from said storage section, and outputs said extracted class word/related term to said conversation pattern processing section based on said input-symbol train, The dialogue approach of claim 16 characterized by preparation ****** thru/or claim 18 given in any 1 term.

[Claim 20] Speech recognition down stream processing which is the bidirectional dialogue approach which is equipped with two or more dialog systems which perform interactive processing among users, and communicates between each set talk systems, and changes into an input-symbol train the voice recognized by recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said input-symbol train based on

the conversation pattern which inputted said input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, The event data transfer process of receiving the event data which transmit to other dialog systems by using said input-symbol train as event data, and consist of a symbol string from a dialog system besides the above, The bidirectional dialogue approach characterized by having the event data storage process of memorizing the event data received from the dialog system besides the above.

[Claim 21] said event data gained by said user's utterance when said privacy protection directions were not inputted as the input process which inputs privacy protection directions of said user -- said -- others -- said event data which gained by said user's utterance when it sent out to a dialog system and said privacy protection directions were inputted -- said -- others -- the bidirectional dialogue approach according to claim 20 characterized by to send out to a dialog system, to twist and to have a privacy protection functional process.

[Claim 22] The bidirectional dialogue approach according to claim 20 or 21 characterized by having the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train.

[Claim 23] The storage process which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered in the storage section, The associative functional process which extracts the class word/related term relevant to [resemblance and] the word which said user uttered from said storage section, and outputs said extracted class word/related term to said conversation pattern processing section based on said input-symbol train, The bidirectional dialogue approach of claim 20 characterized by preparation ****** thru/or claim 22 given in any 1 term.

[Claim 24] The bidirectional dialogue approach of claim 20 characterized by having the 2nd speech recognition down stream processing which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, and the event data storage process of memorizing said 2nd input-symbol train as event data thru/or claim 23 given in any 1 term.

[Claim 25] Speech recognition down stream processing which changes into an input-symbol train the voice recognized by recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, The record medium which recorded the program for

making a computer perform the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train and in which computer reading is possible.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a record medium at the bidirectional dialog system and the bidirectional dialogue approach list which communicate between the dialog system which performs interactive processing among users and the dialogue approach, and a dialog system.

[0002]

[Description of the Prior Art] As this conventional kind of a dialog system, the talkative parrot vocal apparatus indicated by JP,11-9847,A and the electronic instrument for mount indicated by JP,6-239186,A are known, for example.

[0003] A talkative parrot vocal apparatus text-izes the sound signal by which voice input was carried out with a voice text-ized means, adds the response attribute into which the text was inputted by the response attribute input means as an appeal text or a response text, and registers it into a database. At the time of a response, a response text is searched at the appeal text list which text-ized appeal voice with the voice text-ized means by using the response attribute from a response attribute input means as a search key. The searched response text is changed into a sound signal with a response text voice-ized means, and the voice output of it is carried out with a voice output means. Therefore, to appeal, the same language can be returned, or specific language can be returned, and sensibility which the parrot has answered can be acquired.

[0004] Moreover, in order to recognize a speaker's voice, the word of two or more 1st language is memorized, the word of two or more 2nd different language from this corresponding to the 1st language word is memorized, the electronic instrument for mount searches the word of the 2nd language of the 2nd language dictionary section corresponding to the word recognized based on the word of the 1st language, and it synthesizes voice from the searched word and it is outputted. Thereby, a nap of an operator can be prevented.

[0005] Moreover, an internal state is changed by the recognition word which has recognized the voice inputted by the user, and the dialog system to which the word which speaks according to the changed internal state is changed is used by the game

device etc.

[0006] The speech recognition processing section which changes into a symbol string the voice recognized by this dialog system recognizing the microphone which inputs the voice which a user utters, and the voice inputted from this microphone, Conversation with a user is controlled based on the symbol string changed in this speech recognition processing section. It has the loudspeaker which outputs the voice from the conversation pattern processing section which outputs the symbol string suitable for a user to the speech synthesis processing section, the speech synthesis processing section which changes the symbol string from this conversation pattern processing section into voice, and this speech synthesis processing section, and speaks.

[0007] The conversation pattern processing section has a pattern mechanical component and an internal model. A pattern mechanical component inputs a symbol string from the speech recognition processing section, and outputs the symbol string corresponding to the inputted symbol string based on the conversation pattern described beforehand. When a pattern mechanical component detects a specific word, trigger information is inputted from a pattern mechanical component, and an internal model answers trigger information, it changes the model value which is an internal state, and outputs the changed model value to a pattern mechanical component. A pattern mechanical component inputs the model value from an internal model, and changes a word by the conditional expression described in the conversation pattern with reference to this model value during conversational processing.

[0008]

[Problem(s) to be Solved by the Invention] However, if it was in the conventional talkative parrot vocal apparatus and the conventional electronic instrument for mount which were mentioned above, the word with a user's voice was inputted and the word corresponding to the inputted word decided beforehand was outputted. For this reason, the same word will be outputted when the same word is inputted. The logic which generates an output word from an input word is limited, and since the range of conversation is limited when there are few the numbers, a user will get bored with conversation.

[0009] Moreover, although the word which changes a model value and a system utters can be changed if it is in the dialog system mentioned above, it is dependent on the Ruhr which a system holds, and change of a word has not resulted in the level with which human being does not get bored.

[0010] This invention makes it a technical problem to provide with a record medium the dialog system which can perform interactive processing with which a user does not get bored, and can realize tedious dissolution of users, such as an operator, nap prevention of a user, etc. by this by changing the word which a system utters and the dialogue approach, a bidirectional dialog system, and the bidirectional dialogue approach list.

[0011]
[Means for Solving the Problem] This invention was considered as the following configurations, in order to solve said technical problem. The voice input section into which the dialog system of invention of claim 1 inputs the voice which a user utters, The speech recognition processing section which changes into an input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was beforehand described from this speech recognition processing section, The speech synthesis processing section which changes said output symbol string from this conversation pattern processing section into voice, It is characterized by having the voice output section which outputs the voice from this speech synthesis processing section, and speaks, and the conversation property control section to which said output symbol string is changed according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train from said conversation pattern processing section.

[0012] Since a conversation property control section changes an output symbol string according to the property of the conversation which has grasped and grasped the property of a user's conversation based on the input-symbol train from the conversation pattern processing section according to invention of claim 1, a system can perform interactive processing made consistent with each user's property. Therefore, interactive processing with which a user does not get bored can be performed, and this can realize tedious dissolution of users, such as an operator, nap prevention of a user, etc.

[0013] Invention of claim 2 is set to a dialog system according to claim 1. Said conversation property control section It is based on utterance time amount or number of utterance words of a word and a conversation pattern with a user's high use frequency, specific subject, the count of a response of conversation, and a user. It can be characterized by optimizing the subject of the conversation at the time of utterance, a conversation pattern, a generating word, response spacing of conversation, the frequency of utterance, and timing, and interactive processing which the system made consistent with each user's property by this can be performed.

[0014] The voice input section into which the dialog system of invention of claim 3 inputs the voice which a user utters, The speech recognition processing section which changes into an input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was beforehand described from this speech recognition processing section, The speech synthesis processing section which changes said output symbol string from

this conversation pattern processing section into voice, The voice output section which outputs the voice from this speech synthesis processing section, and speaks, and the storage section which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered, Based on said input-symbol train from said conversation pattern processing section, the class word/related term relevant to [resemblance and] the word which said user uttered are extracted from said storage section, and it is characterized by having the associative function part which outputs said extracted class word/related term to said conversation pattern processing section.

[0015] According to invention of claim 3, an associative function part is based on an input-symbol train from the conversation pattern processing section. Extract from the storage section, and since the class word/related term which extracted the class word/related term relevant to [resemblance and] the word which the user uttered are outputted to the conversation pattern processing section, a system When the chain of a dialogue breaks off, the following subject considered for association to be possible by the user can be chosen from the contents of conversation till then, and a system can perform active utterance. Thereby, active utterance of a system can be considered as conversation with what [with / not] but a fixed continuity. [like a random number] Therefore, interactive processing with which a user does not get bored can be performed, and this can realize tedious dissolution of users, such as an operator, nap prevention of a user, etc.

[0016] The voice input section into which the dialog system of invention of claim 4 inputs the voice which a user utters, The 1st speech recognition processing section which changes into the 1st input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said 1st input-symbol train based on the conversation pattern which inputted said 1st input-symbol train and was beforehand described from this 1st speech recognition processing section, The speech synthesis processing section which changes said output symbol string from this conversation pattern processing section into voice, The voice output section which outputs the voice from this speech synthesis processing section, and speaks, and the 2nd speech recognition processing section which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, It is characterized by having the event data storage section which memorizes said 2nd input-symbol train as event data.

[0017] According to invention of claim 4, the 2nd speech recognition processing section changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, and makes the event data storage section memorize by using the 2nd input-symbol train as event data. That is, offer of a system is attained by acquiring event data in the data which the direct user does not have. Moreover, since data are acquirable from voice broadcast,

special equipment is not needed but event data can be acquired cheaply.

[0018] Invention of claim 5 is characterized by having the event data-processing section which only the symbol string which a user demands among said 2nd input-symbol trains changed in said 2nd speech recognition processing section is extracted [section], and makes said event data storage section memorize the extracted symbol string in a dialog system according to claim 4.

[0019] Since according to invention of claim 5 the event data-processing section extracts only the symbol string which a user demands among the 2nd input-symbol trains changed in the 2nd speech recognition processing section and the event data storage section is made to memorize the extracted symbol string, only the symbol string which a user demands is acquirable, and moreover, there is little storage capacity and it ends.

[0020] Invention of claim 6 is characterized by having the conversation property control section to which said output symbol string is changed according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train from said conversation pattern processing section in a dialog system according to claim 4 or 5.

[0021] According to invention of claim 6, in addition to effectiveness according to claim 4 or 5, effectiveness according to claim 1 can be acquired further.

[0022] Invention of claim 7 is set to the dialog system of claim 4 thru/or claim 6 given in any 1 term. The storage section which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered, Based on said input-symbol train from said conversation pattern processing section, the class word/related term relevant to [resemblance and] the word which said user uttered are extracted from said storage section, and it is characterized by having the associative function part which outputs said extracted class word/related term to said conversation pattern processing section.

[0023] According to invention of claim 7, in addition to the effectiveness of claim 4 thru/or claim 6 given in any 1 term, effectiveness according to claim 3 can be acquired further.

[0024] It is the bidirectional dialog system which invention of claim 8 is equipped with two or more dialog systems which perform interactive processing among users, and communicates between each set talk systems. Said each set talk system The voice input section which inputs the voice which a user utters, and the speech recognition processing section which changes into an input-symbol train the voice recognized by recognizing the voice inputted in this voice input section, The conversation pattern processing section which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was beforehand described from this speech recognition processing section, The speech synthesis processing section which changes said output symbol string from this conversation pattern processing section into voice, It transmits to

other dialog systems by using said input-symbol train as event data with the voice output section which outputs the voice from this speech synthesis processing section, and speaks. It is characterized by having the event data transfer section which receives the event data which consist of a symbol string from a dialog system besides the above, and the event data storage section which memorizes the event data received from the dialog system besides the above in this event data transfer section.

[0025] According to invention of claim 8, the event data storage section is made to memorize the event data which the event data transfer section transmitted to other dialog systems by having used the input-symbol train as event data, received the event data which consist of a symbol string from other dialog systems, and received from other dialog systems. That is, a system can acquire data from two or more systems, and can make the amount of collectable data increase easily by delivering and receiving event data mutually between systems.

[0026] The input section into which invention of claim 9 inputs privacy protection directions of said user in a bidirectional dialog system according to claim 8, When said privacy protection directions are not inputted from this input section, said event data gained by said user's utterance are sent out to a dialog system besides the above. When said privacy protection directions are inputted from said input section, it is characterized by sending out said event data gained by said user's utterance to a dialog system besides the above, twisting them, and having a privacy protection function part.

[0027] According to invention of claim 9, a privacy protection function part When privacy protection directions are not inputted from the input section, said event data gained by a user's utterance are sent out to other dialog systems. When privacy protection directions are inputted from the input section, it can control that the contents which the user itself uttered to the system are carelessly sent out to other systems by that which sends out the event data gained by a user's utterance to other dialog systems, and twists them.

[0028] Invention of claim 10 is characterized by having the conversation property control section to which said output symbol string is changed according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train from said conversation pattern processing section in a bidirectional dialog system according to claim 8 or 9.

[0029] According to invention of claim 10, in addition to effectiveness according to claim 8 or 9, effectiveness according to claim 1 can be acquired further.

[0030] Invention of claim 11 is set to the bidirectional dialog system of claim 8 thru/or claim 10 given in any 1 term. The storage section which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered, Based on said input-symbol train from said conversation pattern processing section, the class word/related term relevant to [resemblance and] the word which said user uttered are extracted from said storage section, and it is characterized by having the

associative function part which outputs said extracted class word/related term to said conversation pattern processing section.

[0031] According to invention of claim 11, in addition to the effectiveness of claim 8 thru/or claim 10 given in any 1 term, effectiveness according to claim 3 can be acquired further.

[0032] Invention of claim 12 is characterized by having the 2nd speech recognition processing section which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, and the event data storage section which memorizes said 2nd input-symbol train as event data in the bidirectional dialog system of claim 8 thru/or claim 11 given in any 1 term.

[0033] According to invention of claim 12, in addition to the effectiveness of claim 8 thru/or claim 11 given in any 1 term, effectiveness according to claim 4 can be acquired further.

[0034] Speech recognition down stream processing which changes into an input-symbol train the voice recognized by the dialogue approach of invention of claim 13 recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, It is characterized by having the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train.

[0035] Invention of claim 14 is characterized by for said conversation property control process to optimize the subject of the conversation at the time of utterance, a conversation pattern, a generating word, response spacing of conversation, the frequency of utterance, and timing based on utterance time amount or number of utterance words of a word and a conversation pattern with a user's high use frequency, specific subject, the count of a response of conversation, and a user in the dialogue approach according to claim 13.

[0036] Speech recognition down stream processing which changes into an input-symbol train the voice recognized by the dialogue approach of invention of claim 15 recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said input-symbol train by the conversation pattern processing section based on the conversation pattern which inputted said input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, The storage

process which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered in the storage section, Based on said input-symbol train, the class word/related term relevant to [resemblance and] the word which said user uttered are extracted from said storage section, and it is characterized by having the associative functional process which outputs said extracted class word/related term to said conversation pattern processing section.

[0037] The 1st speech recognition down stream processing which changes into the 1st input-symbol train the voice recognized by the dialogue approach of invention of claim 16 recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said 1st input-symbol train based on the conversation pattern which inputted said 1st input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained in this speech synthesis processing section, and speaks, It is characterized by having the 2nd speech recognition down stream processing which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, and the storage process which memorizes said 2nd input-symbol train as event data.

[0038] Invention of claim 17 is characterized by having the event data-processing process of extracting only the symbol string which a user demands among said 2nd input-symbol trains changed by said 2nd speech recognition down stream processing, and making said event data storage section memorizing the extracted symbol string in the dialogue approach according to claim 16.

[0039] Invention of claim 18 is characterized by having the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train in the dialogue approach according to claim 16 or 17.

[0040] Invention of claim 19 is set to the dialogue approach of claim 16 thru/or claim 18 given in any 1 term. The storage process which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered in the storage section, Based on said input-symbol train, the class word/related term relevant to [resemblance and] the word which said user uttered are extracted from said storage section, and it is characterized by having the associative functional process which outputs said extracted class word/related term to said conversation pattern processing section.

[0041] Invention of claim 20 is equipped with two or more dialog systems which perform interactive processing among users. Speech recognition down stream processing which is the bidirectional dialogue approach which communicates between each set talk systems, and changes into an input-symbol train the voice recognized by recognizing the voice which a user utters, Conversation pattern down stream

processing which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was described beforehand, Speech synthesis down stream processing which changes said output symbol string into voice, and the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, The event data transfer process of receiving the event data which transmit to other dialog systems by using said input-symbol train as event data, and consist of a symbol string from a dialog system besides the above, It is characterized by having the event data storage process of memorizing the event data received from the dialog system besides the above.

[0042] The input process as which invention of claim 21 inputs privacy protection directions of said user in the bidirectional dialogue approach according to claim 20, When said privacy protection directions are not inputted, said event data gained by said user's utterance are sent out to a dialog system besides the above. When said privacy protection directions are inputted, it is characterized by sending out said event data gained by said user's utterance to a dialog system besides the above, twisting them, and having a privacy protection functional process.

[0043] Invention of claim 22 is characterized by having the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train in the bidirectional dialogue approach according to claim 20 or 21.

[0044] Invention of claim 23 is set to the bidirectional dialogue approach of claim 20 thru/or claim 22 given in any 1 term. The storage process which memorizes the class word/related term relevant to [resemblance and] the word which said user uttered in the storage section, Based on said input-symbol train, the class word/related term relevant to [resemblance and] the word which said user uttered are extracted from said storage section, and it is characterized by having the associative functional process which outputs said extracted class word/related term to said conversation pattern processing section.

[0045] Invention of claim 24 is characterized by having the 2nd speech recognition down stream processing which changes into the 2nd input-symbol train the broadcast voice recognized by recognizing the broadcast voice from a broadcasting station, and the event data storage process of memorizing said 2nd input-symbol train as event data in the bidirectional dialogue approach of claim 20 thru/or claim 23 given in any 1 term.

[0046] Speech recognition down stream processing which changes into an input-symbol train the voice recognized by invention of claim 25 recognizing the voice which a user utters, Conversation pattern down stream processing which outputs the output symbol string corresponding to said input-symbol train based on the conversation pattern which inputted said input-symbol train and was described beforehand, Speech

synthesis down stream processing which changes said output symbol string into voice, the voice output process which outputs the voice obtained by this speech synthesis down stream processing, and speaks, It is the record medium which recorded the program for making a computer perform the conversation property control process of changing said output symbol string according to the property of the conversation which has grasped and grasped the property of said user's conversation based on said input-symbol train and in which computer reading is possible.
[0047]
[Embodiment of the Invention] Hereafter, the gestalt of operation of a record medium is explained to the dialog system of this invention and the dialogue approach, a bidirectional dialog system, and the bidirectional dialogue approach list with reference to a drawing.
[0048] (Gestalt of the 1st operation) Drawing 1 is the functional block diagram of the dialog system of the gestalt of the 1st operation. Drawing 2 is the hardware configuration Fig. of the dialog system of the gestalt of the 1st operation. The dialog system shown in drawing 1 is carried in a car, and has a dialog with a user and voice, such as an operator.
[0049] A dialog system controls conversation with a user based on the symbol string changed in the speech recognition processing section 3 which changes into a symbol string (it corresponds to an input-symbol train) the voice recognized by recognizing the microphone 1 which inputs the voice which a user utters, and the voice inputted from this microphone 1, and this speech recognition processing section 3. It has the loudspeaker 9 which outputs the voice from the conversation pattern processing section 5 which outputs the symbol string (it corresponds to an output symbol string) suitable for a user to the speech synthesis processing section 7, the speech synthesis processing section 7 which changes the symbol string from this conversation pattern processing section 5 into voice, and this speech synthesis processing section 7, and speaks.
[0050] The conversation pattern processing section 5 is equivalent to a conversation property control section, and has the pattern mechanical component 31, a calender (clock) 32, the sensor value transform-processing section 33, the internal model (mental model) 34, the pattern database 35, the word dictionary 36, and the event database 37.
[0051] The pattern mechanical component 31 inputs a symbol string from the speech recognition processing section 3, and outputs the symbol string corresponding to the inputted symbol string based on the conversation pattern described beforehand. The conversation pattern described beforehand is a pattern with which the inputted symbol string and the symbol string which should be outputted corresponded, and is stored in the pattern database 35.
[0052] Moreover, a dialog system also processes the input from an external sensor in addition to the voice which a user utters. As an external sensor, it is the calender 32

grade showing the photosensor 11 which detects light, the temperature sensor 12 which detects temperature, the sway sensor 13 which detects vibration, and a date. A/D converters 14a–14c are formed corresponding to a photosensor 11, a temperature sensor 12, and a sway sensor 13, and output the numerical information changed into the digital signal by carrying out numerical conversion in the sensor signal (analog signal) from a sensor to the sensor value transform-processing section 33. In addition, you may constitute so that numerical conversion of the height of the sound of the voice from a microphone 1, the tone quality, etc. may be carried out with an A/D converter at a digital signal and the acquired numerical information may be outputted to the sensor value transform-processing section 33.

[0053] The sensor value transform-processing section 33 changes each numeric value (sensor value) from A/D converters 14a–14c into each variable, and outputs each variable to the pattern mechanical component 31. The pattern mechanical component 31 deals with such numerical information and calender information as a variable, and affects the flow of conversation etc. by the conditional expression described in the conversation pattern with reference to these variables during conversational processing.

[0054] The internal model 34 deals with the reaction accompanied by time amount progress to the pattern mechanical component 31 dealing with the reaction for each conversation of every. When the pattern mechanical component 31 detects a specific word, the internal model 34 inputs trigger information from the pattern mechanical component 31, answers trigger information, changes the model value which is an internal state, and outputs it to the pattern mechanical component 31 by making the changed model value into a variable. Moreover, the internal model 34 processes with reference to event data from the event data table 37.

[0055] The pattern mechanical component 31 inputs the variable from the internal model 34, by the conditional expression described in the conversation pattern with reference to this variable during conversational processing, changes a word and affects the flow of conversation etc. Moreover, according to description of a conversation pattern, by using as event data information acquired from the user all busy, it stores in the event database 37, or refer to the event data for the pattern mechanical component 31 from the event database 37. In case a dialog system quotes some event data at the time of utterance of a system or interprets a user's contents of utterance, refer to the event data for it.

[0056] The event database 37 has the event data table 38 which stored event data as shown in drawing 3 , and the event attribute table 39 which stored the attribute of an event as shown in drawing 4 . The event data table 38 consists of the acquisition path of event data, such as a registration time stump showing the registration time amount of event data, a system, a user, or a teletext, the number of data of event data, the data [0] = data name of event data, a data [1] = attribute 1, and a data [2] = attribute 2 for every event data, as shown in drawing 3 . Each of a data name, an attribute 1,

and an attribute 2 consists of the attribute identifier (attribute ID) and attribute value which are expressed with an ID number.

[0057] For every attribute of an event, an attribute ID and an attribute name correspond and the event attribute table 39 is stored, as shown in <u>drawing 4</u> . For example, if an attribute ID is '1001', an attribute name is 'player name:baseball', and in the event data table 38, if an attribute ID is '1001', 'player name:Shinjo' is stored as attribute value.

[0058] Furthermore, the dialog system has the conversation study section 41 and the study database 43. The conversation study section 41 controls the pattern mechanical component 31 by the property/subject which has grasped and grasped the property/subject of the conversation considered to be desirable for a user from the dialogue of a user and a dialog system.

[0059] The conversation study section 41 For this reason, the I/O symbol string from the pattern mechanical component 31, It is based on a variable from the trigger from the pattern mechanical component 31, and the internal model 34. A word with a user's high use frequency, its classification, the high conversation pattern of a user's use frequency, Utterance time amount or number of utterance words of the durability (count of a response of a dialogue) of conversation and a user to specific subject / contents of conversation etc. is used as an evaluation index. Response spacing of selection of the subject / conversation pattern / generating word, and classification of the conversation at the time of utterance of a system, or the conversation of a system (average conversation spacing), The frequency/timing of the active utterance from a system side are optimized, average conversation spacing etc. is outputted to the pattern mechanical component 31, or a trigger is outputted to it to the internal model 34.

[0060] Moreover, the conversation study section 41 holds the inputted information and the generated information as study data in the study database 43, or refer to the study data held at the study database 43 for it. The word dictionary 36 stores a word and the word is read by the pattern mechanical component 31.

[0061] Next, in the hard block diagram of a dialog system shown in <u>drawing 2</u> , A/D converter 2 changes the voice from a microphone 1 into a digital signal, and outputs a digital signal to a bus 15. D/A converter 8 changes the symbol string from a bus 15 into an analog signal, and outputs this analog signal to a loudspeaker 9. The bulk memories 23, such as a hard disk which stored the read only memory (ROM) 21 as a record medium which stored the control program for performing the central processing unit (CPU) 17 which performs processing, random access memory (RAM) 19, and interactive processing, and data, are connected to the bus 15. A bulk memory 23 is the storage containing the pattern database 35 mentioned above, the word dictionary 36, the event database 37, and the study database 43. In addition, the control program mentioned above may be replaced with ROM19, and may be stored in CD-ROM etc.

[0062] CPU17 is performing the control program stored in ROM21, and each of the speech recognition processing section 3, the speech synthesis processing section 7, the pattern mechanical component 31, the sensor value transform-processing section 33, the internal model 34, and the conversation study section 41 is the function to realize.

[0063] Next, an example of processing of the conversation learning function of the conversation study section 41 which is the description of the dialog system of the gestalt of the 1st operation is explained, referring to drawing 5 . Drawing 5 explains the logic which learns suitable utterance spacing.

[0064] First, time of day t0 is made into current time (step S1), and the conversation total spacing Msum is set to '0', and Count N is set to '0' (step S3). Next, since a trigger is outputted to the conversation study section 41 from the pattern mechanical component 31 when the variable by the sensor signal from a user's symbol string by utterance or photosensor 11 grade is inputted into the pattern mechanical component 31, detection of a trigger is performed (step S5).

[0065] Next, when a trigger is detected, (YES of step S7) and its trigger judge whether it is a system utterance start trigger (it identifies with a flag '01') (step S11), and when a trigger is a system utterance start trigger, it judges whether there are more words of user utterance than a predetermined number (step S13).

[0066] When there are more words than a predetermined number, time of day t0 is lengthened from current time, and it asks for the conversation spacing M (step S15), next let time of day t0 be current time (step S17). Furthermore, the conversation spacing M is added to the conversation total spacing Msum, and let the acquired value be the conversation total spacing Msum (step S19).

[0067] Next, only '1' makes Count N increase and the obtained count is set to N (step S21), and do the division of the conversation total spacing Msum by Count N, and let the acquired value be the average conversation spacing M0 (step S23). And the average conversation spacing M0 is stored in the study database 43 as a variable of the pattern mechanical component 31 (step S25). Moreover, the average conversation spacing M0 is outputted to the pattern mechanical component 31 as a variable. Then, processing of return and step S5 to the step S25 is repeated to step S5, and is performed to it.

[0068] In addition, when there is no trigger at step S7, in NO, in NO, it returns to step S5 immediately at step S13 by step S11.

[0069] Thus, when there are many words which a user utters, the conversation study section 41 judges that average conversation spacing is suitable, grasps the average conversation spacing, and outputs it to the pattern mechanical component 31 by making average conversation spacing into a variable. And the pattern mechanical component 31 outputs a symbol string to the speech synthesis processing section 7 at intervals of the average conversation with reference to average conversation spacing as a variable.

[0070] That is, since the conversation study section 41 controls the pattern mechanical component 31 by the property/subject which has grasped and grasped the property/subject of the conversation considered to be desirable for a user from the dialogue of a user and a dialog system, it can perform interactive processing which the dialog system made consistent with each user's property. Therefore, interactive processing with which a user does not get bored can be performed, and this can realize tedious dissolution of users, such as an operator, nap prevention of a user, etc. Moreover, processing of the conversation study section 41 is realizable because CPU17 performs the control program recorded on ROM21 which is a record medium.

[0071] By the above explanation, although transfer of the data of the conversation study section 41 and the pattern mechanical component 31 was explained next, transfer of the data of the conversation study section 41 and the internal model 34 is explained. First, processing of the conversation study section 41 is explained with reference to drawing 6 . First, mode criticism value is initialized (step S31), and the trigger from the pattern mechanical component 31 is detected (step S33).

[0072] When a trigger is detected, (YES of step S35) and its trigger judge whether it is a system utterance start trigger (step S37), and when a trigger is a system initiation trigger, it judges whether there are more words of user utterance than a predetermined number (step S39).

[0073] When there are more words than a predetermined number, a conversational-mode recurring demand trigger (it identifies with a flag '10') is published (step S41), and it returns to step S33. In addition, when there is no trigger at step S35, in NO, in NO, it returns to step S33 immediately at step S39 by step S37.

[0074] Next, processing of the internal model 34 is explained with reference to drawing 7 . First, a model value is initialized (step S51) and the model value Mx is set to '0' (step S52). And the trigger from the conversation study section 41 is detected (step S53).

[0075] When there is a trigger, (YES of step S55) and its trigger judge whether it is a system utterance start trigger (step S57). When a trigger is not a system initiation trigger, the trigger judges whether it is a conversational-mode recurring demand trigger (step S59).

[0076] When a trigger is a conversational-mode recurring demand trigger, a subtraction value is subtracted from the model value Mx, the acquired value is made into the new model value Mx (step S61), and it returns to step S53.

[0077] In step S57, when it judges whether the conversational mode changed when a trigger was a system utterance start trigger (step S63) and the conversational mode changes, an aggregate value is added to the model value Mx, the acquired value is made into the new model value Mx (step S65), and it returns to step S53. Moreover, in step S63, when the conversational mode does not change, the model value Mx is set to '0' (step S67), and it returns to step S53. Thus, the model value of the internal

model 34 can be changed by the trigger from the conversation study section 41, and it can input into the conversation study section 41 by making the changed model value into a variable.

[0078] (Gestalt of the 2nd operation) Next, the dialog system and the dialogue approach of a gestalt of the 2nd operation are explained. Drawing 8 is the functional block diagram of the dialog system of the gestalt of the 2nd operation. The dialog system of the gestalt of the 2nd operation is characterized by forming the associative function part 45, and the class word / related term dictionary 47 instead of the conversation study section 41 and the study database 43 which are shown in drawing 1 .

[0079] In addition, since it is the configuration as the configuration of the dialog system of the gestalt of the 1st operation shown in drawing 1 with the same configuration of others of a dialog system shown in drawing 8 , the same part attaches the same sign and the explanation is omitted.

[0080] The class word / related term dictionary 47 stores a class word and a related term similar to the word which the user uttered, or the word which the system uttered.

[0081] Based on the classification of the word in the I/O symbol string from pattern mechanical-component 31a, or the symbol string obtained with reference to the word dictionary 36, the associative function part 45 extracts the word relevant to conversation from a class word / related term dictionary 47, and outputs the extracted class word / related word group to pattern mechanical-component 31a as a variable. That is, with reference to a class word / related term dictionary 47, the associative function part 45 extracts the class word/related term relevant to the word which the all busy user uttered, or the word which the system uttered, and determines the contents of active utterance of a system using the classification of the extracted class word / related term, or its word.

[0082] Moreover, at the time of the chain termination of conversation, the associative function part 45 chooses a suitable word from the word dictionary 36 based on the conversation hysteresis information in front of chain termination (when conversation once breaks off), extracts the word relevant to the word chosen with reference to the class word / related term dictionary 47, and outputs it to pattern mechanical-component 31a. At the time of next active utterance, a dialog system performs the utterance containing the extracted word or the event data containing the word (when a system speaks actively).

[0083] Next, the example of processing of the associative function part 45 is explained. In this example, the logic which obtains the class word of a word with the high frequency of occurrence is explained, referring to drawing 9 . First, word hysteresis is initialized (step S73) and detection of the trigger from pattern mechanical-component 31a is performed (step S75).

[0084] Next, when there is a trigger, (YES of step S75) and its trigger judge whether it

is a conversation termination trigger (it identifies with a flag '11') (step S77), and when a trigger is a conversation termination trigger, an all busy word is added to word hysteresis (step S79). And word group W[] of the frequency-of-occurrence size in word hysteresis is created (step S81).

[0085] Next, class word group S[] is initialized (step S83), and I is set to '0' (step S85). The class word/related term of word group W[I] are searched from a class word / related term dictionary 47 (step S87), and the word group of a retrieval result is added to class word group S[] (step S89).

[0086] And only '1' makes I increase (step S91), and it judges whether I became more than the number of words of word group W[] (step S93), and when I is under the number of words of word group W[], it returns to step S85.

[0087] When I becomes more than the number of words of word group W[], word group W [], class word group S[] is stored as a variable of pattern mechanical-component 31a (step S95), and it returns to step S73. In addition, when there is no trigger in step S75, in being NO in step S77, it returns to step S73 immediately.

[0088] Next, the example of word group W [], class word group S[] is explained. word hysteresis -- for example, word hysteresis ={Uehara (2), a giant (3), a rahmen (2), and the weather (3) .. if it considers as} and arranges in a word group -- each word group -- the weather =44 point {weather, a forecast, fine, cloudiness, and a maximum air temperature ..}, baseball =38 point {Uehara, a giant, a strikeout, and a pitcher -- .. --}, a meal =13 point {rahmen, daytime boiled rice, Calais, and Biel -- .. -- it becomes} if and the "weather" is chosen as a word group of frequency-of-occurrence size -- word group W[-- the]={weather, a forecast, fine, cloudiness, and a maximum air temperature .. it becomes}.

[0089] Next, if the class word/related term of each word of word group W[] are extracted, it will become weather -> {the weather, the weather, and fine}, forecast -> {a weather report}, fine -> {fine weather, a fine autumn day, fine weather, and fine weather}, and cloudy -> {clouds and a clouded sky}. And when the set of a class word is generated, they are the class word group S[]={weather, the weather, fine, a weather report, fine weather, and a fine autumn day.. It becomes}.

[0090] And obtained word group W [], class word group S[] is referred to as a variable by pattern mechanical-component 31a, at the time of active utterance of a dialog system, searches the event data containing the word relevant to an old conversation, or its word, and speaks.

[0091] Thus, the associative function part 45 can choose from the contents of conversation till then also as a user the following subject considered for association to be possible, when the chain of a dialogue breaks off, and a dialog system can perform active utterance. Thereby, active utterance of a dialog system can be considered as conversation with what [with / not] but a fixed continuity. [like a random number] Therefore, interactive processing with which a user does not get bored can be performed, and this can realize tedious dissolution of users, such as an

operator, nap prevention of a user, etc. Moreover, processing of the associative function part 45 is realizable because CPU17 performs the control program recorded on ROM21 which is a record medium.

[0092] (Gestalt of the 3rd operation) Drawing 10 is the functional block diagram of the bidirectional dialog system of the gestalt of the 3rd operation. The bidirectional dialog system of the gestalt of the 3rd operation is equipped with the dialog system 70 which performs interactive processing among users, the broadcasting station 71, and the bidirectional intellectual conversational system 73. The bidirectional intellectual conversational system 73 is constituted identically to the configuration of a dialog system 70. A dialog system 70 and the bidirectional intellectual conversational system 73 communicate mutually.

[0093] Moreover, instead of the conversation study section 41 and the study database 43 which are shown in drawing 1 , a dialog system 70 prepares the event data acquisition section 49, the event data-processing section 53, the event data transfer section 55, the privacy protection function part 59, and switch 61 grade, and is characterized by acquiring the event data from voice broadcast, and the event data from small power radio equipment in addition to the event data based on a user's utterance.

[0094] In addition, since it is the configuration as the configuration of the dialog system of the gestalt of the 1st operation shown in drawing 1 with the same configuration of others of a bidirectional dialog system shown in drawing 10 , the same part attaches the same sign and the explanation is omitted.

[0095] Like the data acquisition (VICS etc.) by the teletext (FM multiplex broadcast), and the data acquisition by mobile communications (a cellular phone/PHS), the event data acquisition section 49 does not acquire data by data communication, by speech recognition, data-izes the sound signal of TV/radio broadcasting from a broadcasting station 71, and acquires it as event data. The event data acquisition section 49 has the broadcast receiving set 50 and the speech recognition processing section 51. The broadcast receiving set 50 receives the voice broadcast from a broadcasting station 71, and the speech recognition processing section 51 changes the sound signal included in the received voice broadcast into a symbol string.

[0096] The event data-processing section 53 extracts data from the symbol string from the speech recognition processing section 51 according to a specific pattern (regulation described apart from the common conversation pattern), and stores them in event database 37b by using the extracted data as event data.

[0097] For this reason, a dialog system 70 can provide a user with the event data which the direct user does not have. Moreover, since event data are acquirable from voice broadcast, special equipment is not needed but event data can be acquired cheaply.

[0098] Moreover, the event data-processing section 53 may extract only the data which a user demands from the symbol string from the speech recognition processing

section 51, and may store them in event database 37b by using the extracted data as event data. If it does in this way, only the event data which a user requests from event database 37b are stored, and there will be little storage capacity of event database 37b, and it will end.

[0099] On the other hand, the event data transfer section 55 delivers and receives event data between a dialog system 70 and the bidirectional intellectual conversational system 73, and has the small power radio equipment 56 and a transmitting and receiving controller 57. The small power radio equipment 56 delivers and receives event data between the bidirectional intellectual conversational systems 73 by the wireless electric wave. A transmitting and receiving controller 57 controls transmission and reception of event data, transmits the event data received with the small power radio equipment 56 to event database 37b through the event data-processing section 53, and transmits the event data from the privacy protection function part 59 to the bidirectional intellectual conversational system 73 through the small power radio equipment 56.

[0100] A switch 61 inputs privacy protection directions into the privacy protection function part 59, in order to control sending out of the event data in connection with the privacy of the user whom the user uttered by turning on. Send out the event data gained by a user's utterance to a transmitting and receiving controller 57, and there is no privacy protection function part 59, when the event data gained by a user's utterance when privacy protection directions were not inputted from a switch 61 are sent out to a transmitting and receiving controller 57 and privacy protection directions are inputted from a switch 61.

[0101] Next, the event data transfer function by the event data transfer section 55 is explained. First, if the event data transfer section 55 sends out a fixed subcarrier to the bidirectional intellectual conversational system 73, the subcarrier will be answered and the bidirectional intellectual conversational system 73 will transmit a response wave to the event data transfer section 55. The event data transfer section 55 will establish the communication link with the bidirectional intellectual conversational system 73 through a fixed communication procedure, if the response wave from the bidirectional intellectual conversational system 73 is received.

[0102] A data demand is bidirectionally transmitted between the systems which the communication link established. The requirements for data (the range of retrieval conditions and the date time of day etc.) are added to a data demand. For example, the bidirectional intellectual conversational system 73 sends out the demanded data (data which agree in it when requirements are specified) for which the data demand was received, and in the dialog system 70 of a requestor side, the event data transfer section 55 receives data, and stores it in event database 37b through the event data-processing section 53.

[0103] Moreover, when a dialog system 70 receives the sending-out demand of the event data of specific conditions from the bidirectional intellectual conversational

system 73, the event data transfer section 55 sends out the event data according to the demand to the bidirectional intellectual conversational system 73.

[0104] Thus, a dialog system 70 can acquire data from two or more alien systems, and can make the amount of collectable data increase easily, when the event data transfer section 55 which has the small power radio equipment 56 delivers and receives event data mutually between systems.

[0105] Moreover, although the grasp of the small power radio equipment 56 is comparatively narrow, data can be transmitted also between the systems which only the distance exceeding the grasp of small power radio equipment 56 simple substance left by going via two or more systems continuously. When some or all of a system is especially carried in mobiles, such as a car, the range in which data transmission is possible is expanded easily.

[0106] In addition, when not passing through the procedure of communication link establishment and the data from other systems are received, you may make it each system store the data in event database 37b.

[0107] Next, with reference to drawing 11 , the logic of the privacy protection function of event data is explained. First, sending-out event E[] for sending out to the bidirectional intellectual conversational system 73 from a dialog system 70 is initialized (step S101), and I is set to '0' (step S103). Furthermore, a privacy protection function judges [ON or] whether it is off by whether a switch 61 is off in ON (step S105), when a privacy protection function is ON, a sending-out schedule event is set to K, and the classification of E0 [I] is distinguished (step S107).

[0108] Next, the sending-out schedule event K judges whether it is user utterance (step S109), when the sending-out schedule event K is not user utterance, E0 [I] is added to E [I] (step S111), and only '1' makes I increase (step S113). On the other hand, in step S109, when the sending-out schedule event K is user utterance, it progresses to step S113 immediately.

[0109] Next, I judges whether it is more than the number of elements of E0[] (step S115), and when I is under the number of elements of E0[], processing from return and step S107 to step S115 is repeated to step S107. When I is more than the number of elements of E0[], sending-out event E[] is outputted to a transmitting and receiving controller 57 (step S117).

[0110] On the other hand, in step S105, when a privacy protection function is off, sending-out event E[] is outputted to a transmitting and receiving controller 57 as it is (step S119). That is, the event data which passed the check of the privacy protection function part 59 are sent out to the bidirectional intellectual conversational system 73 through the small power radio equipment 73 by the transmitting and receiving controller 57.

[0111] Thus, when a user directs privacy protection with a switch 61 or voice, or when a demand is received from other systems, send out the event data gained by a user's utterance, and there is no privacy protection function part 59. That is, it can

control that the contents which the user itself uttered to the system are carelessly sent out to other systems by the privacy protection function. In addition, the event data received from voice broadcast or other systems are sent out.

[0112] Moreover, processing of the speech recognition processing section 51, the event data-processing section 53, a transmitting and receiving controller 57, and the privacy protection function part 59 is realizable because CPU17 performs the control program recorded on ROM21 which is a record medium.

[0113] (Gestalt of the 4th operation) Next, the bidirectional dialog system and the bidirectional dialogue approach of a gestalt of the 4th operation are explained. Drawing 12 is the functional block diagram of the bidirectional dialog system of the gestalt of the 4th operation. The 1st, and the dialog system of the gestalt of the 2nd operation and the bidirectional dialog system of the gestalt of the 3rd operation are merged by the bidirectional dialog system of the gestalt of the 4th operation.

[0114] According to the bidirectional dialog system of the gestalt of the 3rd operation, such effectiveness that each of the 1st, and the dialog system of the gestalt of the 2nd operation and the bidirectional dialog system of the gestalt of the 3rd operation has can be acquired.

[0115] In addition, this invention, without being limited to the dialog system of the gestalt of the 1st operation thru/or the bidirectional dialog system of the gestalt of the 4th operation The dialog system by which the dialog system of the gestalt of the 1st operation and the dialog system of the gestalt of the 2nd operation were merged, Of course, can apply also to the bidirectional dialog system by which the dialog system of the gestalt of the 2nd operation and the bidirectional dialog system of the gestalt of the 3rd operation were merged, and the bidirectional dialog system by which the dialog system of the gestalt of the 1st operation and the bidirectional dialog system of the gestalt of the 3rd operation were merged.

[0116] Moreover, although the dialog system of the gestalt of the 1st operation thru/or the bidirectional dialog system of the gestalt of the 4th operation were carried in the car and a user and dialogues, such as an operator, were performed, this invention can be applied to the care system which cares for an old man etc., and can be applied also to the bidirectional care system which communicates among further two or more care systems. In short, if the system is a dialog system which performs a dialogue with a user, it is applicable also to the alien system.

[0117]
[Effect of the Invention] According to the dialog system of invention of claim 1, a system can perform interactive processing made consistent with each user's property. Therefore, interactive processing with which a user does not get bored can be performed, and this can realize tedious dissolution of users, such as an operator, nap prevention of a user, etc. Moreover, the effectiveness as the effectiveness of claim 1 also with the same dialogue approach of invention of claim 13 is acquired.

[0118] The effectiveness as the effectiveness of claim 1 with the same dialog system

of invention of claim 2 is acquired. Moreover, the effectiveness as the effectiveness of claim 2 also with the same dialogue approach of invention of claim 14 is acquired.

[0119] According to the dialog system of invention of claim 3, a system can choose from the contents of conversation till then also as a user the following subject considered for association to be possible, when the chain of a dialogue breaks off, and a system can perform active utterance. Thereby, active utterance of a system can be considered as conversation with what [with / not] but a fixed continuity. [like a random number] Therefore, interactive processing with which a user does not get bored can be performed, and this can realize tedious dissolution of users, such as an operator, nap prevention of a user, etc. Moreover, the effectiveness as the effectiveness of claim 3 also with the same dialogue approach of invention of claim 15 is acquired.

[0120] According to the dialog system of invention of claim 4, offer of a system is attained by acquiring event data in the data which the direct user does not have. Moreover, since data are acquirable from voice broadcast, special equipment is not needed but event data can be acquired cheaply. Moreover, the effectiveness as the effectiveness of claim 4 also with the same dialogue approach of invention of claim 16 is acquired.

[0121] According to the dialog system of invention of claim 5, only the symbol string which a user demands is acquirable, and moreover, there is little storage capacity and it ends. Moreover, the effectiveness as the effectiveness of claim 5 also with the same dialogue approach of invention of claim 17 is acquired.

[0122] According to the dialog system of invention of claim 6, in addition to effectiveness according to claim 4 or 5, effectiveness according to claim 1 can be acquired further. Moreover, the effectiveness as the effectiveness of claim 6 also with the same dialogue approach of invention of claim 18 is acquired.

[0123] According to the dialog system of invention of claim 7, in addition to the effectiveness of claim 4 thru/or claim 6 given in any 1 term, effectiveness according to claim 3 can be acquired further. Moreover, the effectiveness as the effectiveness of claim 7 also with the same dialogue approach of invention of claim 19 is acquired.

[0124] According to the bidirectional dialog system of invention of claim 8, a system can acquire data from two or more systems, and can make the amount of collectable data increase easily by delivering and receiving event data mutually between systems. Moreover, the effectiveness as the effectiveness of claim 8 also with the same bidirectional dialogue approach of invention of claim 20 is acquired.

[0125] According to the bidirectional dialog system of invention of claim 9, it can control that the contents which the user itself uttered to the system are carelessly sent out to other systems. Moreover, the effectiveness as the effectiveness of claim 9 also with the same bidirectional dialogue approach of invention of claim 21 is acquired.

[0126] According to the bidirectional dialog system of invention of claim 10, in

addition to effectiveness according to claim 8 or 9, effectiveness according to claim 1 can be acquired further. Moreover, the effectiveness as the effectiveness of claim 10 also with the same bidirectional dialogue approach of invention of claim 22 is acquired.
[0127] According to the bidirectional dialog system of invention of claim 11, in addition to the effectiveness of claim 8 thru/or claim 10 given in any 1 term, effectiveness according to claim 3 can be acquired further. Moreover, the effectiveness as the effectiveness of claim 11 also with the same bidirectional dialogue approach of invention of claim 23 is acquired.
[0128] According to the bidirectional dialog system of invention of claim 12, in addition to the effectiveness of claim 8 thru/or claim 11 given in any 1 term, effectiveness according to claim 4 can be acquired further. Moreover, the effectiveness as the effectiveness of claim 12 also with the same bidirectional dialogue approach of invention of claim 24 is acquired.
[0129] According to invention of claim 25, effectiveness according to claim 1 and the same effectiveness are acquired because a computer executes the program recorded on the record medium.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the functional block diagram of the dialog system of the gestalt of the 1st operation.
[Drawing 2] It is the hardware configuration Fig. of the dialog system of the gestalt of the 1st operation.
[Drawing 3] It is drawing showing the event data table prepared in the dialog system of the gestalt of the 1st operation.
[Drawing 4] It is drawing showing the event attribute table prepared in the dialog system of the gestalt of the 1st operation.
[Drawing 5] It is the flow chart which shows the dialogue approach realized by the dialog system of the gestalt of the 1st operation.
[Drawing 6] It is the flow chart which shows processing of the conversation study section prepared in the dialog system of the gestalt of the 1st operation.
[Drawing 7] It is the flow chart which shows processing of the internal model prepared in the dialog system of the gestalt of the 1st operation.
[Drawing 8] It is the functional block diagram of the dialog system of the gestalt of the 2nd operation.
[Drawing 9] It is the flow chart which shows the dialogue approach realized by the dialog system of the gestalt of the 2nd operation.

[Drawing 10] It is the functional block diagram of the bidirectional dialog system of the gestalt of the 3rd operation.

[Drawing 11] It is the flow chart which shows the dialogue approach realized by the bidirectional dialog system of the gestalt of the 3rd operation.

[Drawing 12] It is the functional block diagram of the bidirectional dialog system of the gestalt of the 4th operation.

[Description of Notations]

1 Microphone

3 Speech Recognition Processing Section

5 Conversation Pattern Processing Section

7 Speech Synthesis Processing Section

9 Loudspeaker

11 Photosensor

12 Temperature Sensor

13 Sway Sensor

31 Pattern Mechanical Component

33 Sensor Value Transform-Processing Section

34 Internal Model

35 Pattern Database

36 Word Dictionary

37 Event Database

41 Conversation Study Section

43 Study Database

45 Associative Function Part

47 Class Word / Related Term Dictionary

49 Event Data Acquisition Section

53 Event Data-Processing Section

55 Event Data Transfer Section

59 Privacy Protection-Feature Section

61 Switch

70 Dialog System

71 Broadcasting Station

73 Bidirectional Intellectual Conversational System